

REMARKS

Applicants request favorable reconsideration of the subject application in view of the foregoing amendments and the following remarks.

Claims 11-24 are pending in the present application, with claims 11, 14, 16, 19, and 21 being the independent claims. Claims 1, 2, 5, 6, and 8 have been cancelled without prejudice to or disclaimer of the subject matter previously recited therein. Claims 20-24 are newly presented. Claims 11, 14-16, and 19 have been amended herein.

Support for the amendments to the claims may be found in the specification as originally filed, for example, on pages 3-4; on pages 15-16; from page 18, line 14 to page 19, line 6; from page 24, line 27 to page 25, line 3; on pages 39-40; and in the Examples. Accordingly, no new matter has been added.

Claims 1, 2, 5, 6, 8, and 11-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0144377 A1 (Sano et al.). This rejection is respectfully traversed.

Independent claim 11, as amended herein, recites a polymer-containing composition comprising a block polymer compound, water or an aqueous solvent, and a functional material, wherein the block polymer compound comprises block segments A, B, and C arranged in succession, the block segment B is a hydrophilic block segment or a stimulus-responsive hydrophobic block segment, the block segment C is most hydrophilic while the block segment A is most hydrophobic, the block segment C has an ionic group or an acidic group, and the block segment C is a repeating unit represented by a general formula (1). The other independent claims include analogous features.

With the presently claimed invention, an ABC triblock polymer in a polymer-containing composition can have a block segment C that is most hydrophilic and a block segment A that is most hydrophobic, while the block segment B can be a hydrophilic block segment or a stimulus-responsive hydrophobic block segment. Because an ABC triblock polymer according to the present claimed invention has such a structure, it can form a micelle with a functional substance such as pigments in water or an aqueous solvent.

Since the claimed stimulus-responsive hydrophobic block segment B has a higher hydrophilicity than a typical hydrophobic segment, the hydrophobic block segment A can be adsorbed on the functional substance. Thereby, the hydrophilic block segment C or the hydrophilic or stimulus-responsive hydrophobic block segment B can become a hydrophilic portion of the micelle. As a result, in water or an aqueous solvent, the micelle that can be formed by the ABC triblock polymer has a longer hydrophilic portion than a micelle formed, for example, by a block polymer that has a non-stimulus-responsive hydrophobic block segment B instead of the claimed stimulus-responsive hydrophobic block segment B.

Since the micelle that can be formed by the ABC triblock polymer in water or an aqueous solvent has a long hydrophilic portion as discussed above, electrostatic repulsion as well as steric hindrance are likely to be produced between such micelles, thereby achieving good dispersion.

Moreover, in the ABC triblock polymer in the claimed polymer-containing composition, the block segment C has a repeating unit represented by the recited general formula (1). When the ABC triblock polymer forms a micelle with a functional substance such as pigments in water or an aqueous solvent, the hydrophobic block segment A is adsorbed on the functional substance, and the hydrophilic block segment C becomes the outermost segment of the micelle. Since the

block segment C that comprises the outermost segment of the micelle has a repeating unit represented by the general formula (1), good dispersion can be obtained.

When the block segment B of the ABC triblock polymer in the claimed polymer-containing composition is a hydrophilic block segment, the hydrophilic portion of the micelle formed with a functional substance such as pigments in water or an aqueous solvent is thus made up of the block segments B and C, and hence the hydrophilic portion becomes long. Therefore, when the claimed polymer-containing composition spreads over a recording medium and the amount of water or the aqueous solvent present around the micelle decreases, interaction of the hydrophilic portion is caused between the micelles, thereby increasing viscosity. Since the claimed polymer-containing composition can show a high viscosity, good ability to fix to a recording medium can be produced.

When the block segment B of the ABC triblock polymer in the claimed polymer-containing composition is a stimulus-responsive hydrophobic block segment, the block segment B has a certain hydrophilicity and also becomes a hydrophilic segment when given a stimulus. Thus, interaction of the hydrophilic portion is similarly caused between the micelles, thereby increasing viscosity. Again, as a result, good fixing ability can be produced.

The remarkable effects discussed above are evident upon reviewing the results of the Examples and the Comparative Examples described in the specification of the present application.

The Sano et al. publication recites in claim 7 thereof a block copolymer in which two blocks A and B are both hydrophobic and in which a third block C “can be freely chosen.” However, the actual specification of the Sano et al. publication does not disclose any ABC block

copolymer in which a block A is hydrophobic. Rather, as can be seen in the description in paragraphs [0016] to [0024], the Sano et al. publication discloses that the block A is hydrophilic. Moreover, Applicants would like to direct the Examiner's attention to the online filewrapper of U.S. Application No. 10/092,003, which is the application that is the basis of the Sano et al. publication. As can be seen in the "Claims" documents dated May 21, 2002, April 11, 2002, and March 6, 2002, claim 7 of U.S. Application No. 10/092,003 recites that "block A is hydrophilic" (emphasis added).

In view of the above, Applicants submit that the phrase "block A is hydrophobic" in claim 7 of the Sano et al. publication appears to be a clerical error for "block A is hydrophilic" (emphases added). Accordingly, Applicants submit that the Sano et al. publication does not actually teach or suggest the subject matter relied upon by the Examiner in the Office Action, and in particular, the Sano et al. publication does not teach or suggest at least that, in an ABC block polymer, the block segment C is most hydrophilic while the block segment A is most hydrophobic, as required by the claims of the present application.

Additionally, the Sano et al. publication discloses that the dispersants in the examples thereof were prepared according to the procedure disclosed in Japanese Patent Application Laid-Open No. H11-269418 (paragraph [0166]). However, all of the dispersants prepared by the procedure disclosed in Japanese Patent Application Laid-Open No. H11-269418 are AB-type diblock polymers, not ABC-type triblock polymers. This further supports Applicants' assertion that the Sano et al. publication does not teach or suggest the presently claimed invention.

Furthermore, according to the Sano et al. publication, the block B in the disclosed block copolymer is always hydrophobic (paragraph [0075]). Where a block segment B is hydrophobic,

when a block polymer forms a micelle with a functional substance such as pigments in water or an aqueous solvent, the block segment B is adsorbed on the functional substance, and so the hydrophilic portion of the micelle does not become a long portion. As a result, the level of good dispersion that can be obtained with the presently claimed invention cannot be achieved by following the disclosure of the Sano et al. publication. As well, interaction of the hydrophilic portion is hardly caused between the micelles, and viscosity is not increased, so the level of good fixing ability that can be obtained with the presently claimed invention cannot be achieved by following the disclosure of the Sano et al. publication.

In view of the above, Applicants submit that the independent claims patentably distinguish the present invention over the Sano et al. publication. Reconsideration and withdrawal of the §103 rejection of the claims are therefore requested.

The dependent claims are also submitted to be patentable, due to their dependency from the independent base claims, as well as due to additional features that are recited.

Applicants believe that this Amendment After Final Rejection is fully responsive to the outstanding Final Office Action, and that the amendment places the subject application in condition for allowance. This amendment was not presented earlier because Applicants believed that the prior amendment placed the application in condition for allowance. Applicants request entry of this amendment as an earnest attempt to advance prosecution. Favorable reconsideration is respectfully requested.

Applicants' undersigned attorney may be reached in Washington, D.C. by telephone at (202) 530-1010. All correspondence should continue to be directed to the address given below.

Respectfully submitted,

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